

MANAGEMENT OF CHRONIC PLANTAR ULCERS IN LEPROSY BY FLAP SURGERY

(B.K. RATH, B.K. DAS, J.M. DAS AND P.P. KUMAR)

SUMMARY

Thirty three cases of chronic plantar ulcers due to leprosy were treated by flap surgery and the result analysed. It was observed that local skin flap were suitable for small defects especially in the forefoot. Muscle flaps were most suitable for ulcers of heel. The best procedure currently available to reconstruct ulcers in the weight bearing areas was provided by myocutaneous flaps. Fascio-cutaneous flaps were found useful for covering large defects. Cross-leg and Cross-foot flaps were not suitable for weight-bearing areas and were associated with prolonged immobilisation.

(Key words : Leprosy, Plantar ulcer, Flap surgery, Split skin graft).

Leprosy is one of the major public health problems in our country. This part of the country is a hyper-endemic area with a prevalence rate of 12/1000 population. Plantar ulcer is the commonest major foot lesion in Leprosy (Cochrane, 1964). 10-15% of cases present with trophic ulcers (Price, 1961). It is the most troublesome, intractable and distressing problem resulting in patients ostracism. Further it was found that chronic plantar ulcers are prone to malignant changes (Arora, 1987).

Multiple modalities of treatment have been devised by various workers but no definite conclusion in respect of the most suitable approach could be arrived. The present study is aimed to evolve a durable and longlasting method based on plastic and reconstructive surgical procedures.

Material and Methods

In the present study 33 patients with chronic plantar ulcers were selected from among the patients attending the outpatient department of M.K.C.G. Medical College, Berhampur, from September, 1988 to August, 1990. Patients with foot drop, disorganised foot and osteomyelitis of the underlying bone were excluded from the study. Patients were under antileprotic treatment and were bacteriologically negative.

Before surgery routine investigations of blood, stool, urine, blood sugar, X-ray of foot (to exclude bony involvement) and culture & sensitivity of wound swab were done. Ulcer debridement was undertaken to prepare the ulcer for definitive surgery. Daily dressing was done with hydrogen-peroxide and providone iodine and the ulcer was covered with sterile vaseline gauge.

1. **Skin flap:**— Ten patients with fore foot ulcers

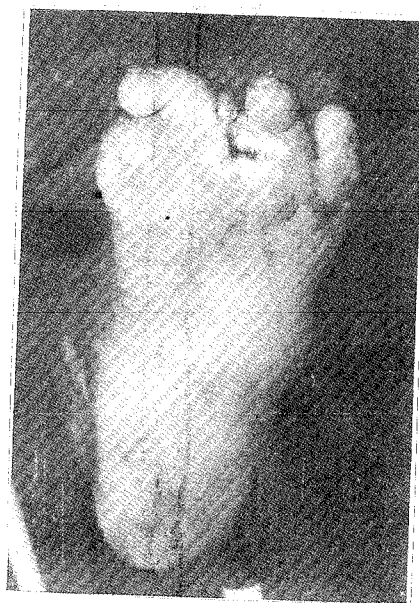


Fig. 1

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Fig. 2



Fig. 4

Fig. 1-4 Showing result of treatment in Fore-foot ulcers.



Fig. 3

were treated by local rotation skin flaps from non-weight bearing area. The donor defect was split skin-grafted. One case of fore-foot ulcer over 1st metatarsal head was treated by filleted great toe.(Fig. 1-4)

2. **Muscle Flap** :— Two patients having ulcer in the heel and 1 in the fore-foot were treated by muscle flaps. One Abductor hallucis and two abductor digiti minimi muscles were used depending on the site of ulceration. The muscle flaps were primarily split skin grafted.
3. **Myocutaneous flap** :— Nine patients of ulcers were treated by Flexor digitorum brevis myocutaneous flap. The distribution of ulcers was one in heel, 3 in lateral border and 5 in fore-foot. The flap was raised from instep non-weight bearing area and the donor defect was immediately split skin grafted.
4. **Fascio-cutaneous flap** :— Six patients of ulcers, 2 in the heel and 4 in the forefoot were treated by fasciocutaneous flaps. The plane of elevation of the flap was between plantar aponeurosis and flexor digitorum brevis muscle. (Fig. 5-8) The flap was based on medial plantar vessels in 4 cases and lateral plantar vessels in 2 cases. The donor defect was immediately split skin grafted.



Fig. 5



Fig. 6

Fig. 5-8 Showing result of treatment in a ulcer of the heel.



Fig. 7



Fig. 8

Cross-leg flap: Two patients with heel ulcers were treated by cross-leg flap, one taken from opposite calf and the other from opposite thigh. The flaps were detached after 3 weeks interval and reinserted over the ulcer. The donor defect was split skin grafted.

Cross-foot flap: Two patients with heel ulcers were treated by cross-foot flap raised from non-weight bearing area of opposite foot. After 3 weeks the flap was detached and reinserted to cover the ulcer. The donor defect was split skin grafted.

In all the cases the limb was elevated over Bohler's Brahm's splint for 2 weeks to prevent post-operative oedema and stasis. The wound was covered with vaseline gauze. Stitches were removed after 2 weeks of operation and partial weight-bearing with proper footwear was permitted after an interval of 6 weeks.

The cases were followed up for 3 months and 6 months interval. At each follow-up the flaps were examined for change in colour, texture and sensation. The results were rated as good, fair or poor depending on the criteria laid down by Belsare (1979).

Observations

The ulcers were most common in the age group of 41-50 years (39.3%) as shown in Tab-1. Males were more frequently affected than females in a ratio of 4 : 1. Borderline type of patients were mostly involved (Tab. 2). Almost all were from low socio-economic status. The average duration of ulcer was 1-3 years (Tab. 3). One patient had ulcer for 12 years. Forefoot was more frequently involved than other parts (Tab. 4).

Of the various methods employed 88% good results were obtained with myocutaneous flaps, 72% with skin flaps and 66% with fascio-cutaneous flaps at the time of discharge. (Tab. 5) The results further improved in the 3 month and 6 months follow-up. The average duration of hospital stay was about 3-4 weeks, (Tab. 6). Mild to moderate infection was noted in 15 cases (45%) but were managed by daily dressing and antibiotics. Partial flap necrosis was observed in 6

Table-I Age Incidence

Age in years	Number of patients		Total	Percentage
	Group A	Group B		
10-20	-	-	-	0
21-30	7	2	9	27.27
31-40	6	2	8	24.24
41-50	13	-	13	39.39
Above 50	3	-	3	9.09
TOTAL	29	4	33	100

Table-II Type of Leprosy

Group	TT	BT	BB	BL	LL	Total
A	-	7	14	6	2	29
B	-	3	1	-	-	4
TOTAL	-	10	15	6	2	33

Table-III Duration of Ulcer

Duration of ulcer.	Number of patients		Total	Percentage
	Group A	Group B		
3-6 months	2	-	2	6
6m-1 yr	5	3	8	24
1-3 yrs	11	1	12	36
3-5 yrs	4	-	4	12
more than 5	7	-21		

Table-IV Distribution of Ulcer

Site of ulcer.	No. of patients		Total	Percentage
	Group A	Group B		
Fore foot :-				
1st metatarsal head	10	-	10	30
2nd -do-	7	-	7	21
3rd -do-	2	-	2	6
4th -do-	1	-	1	3
5th -do-	1	-	1	3
Heel	5	4	9	27
Lateral border	3	-	3	9
TOTAL	29	4	33	100

Table-V Result of Various Operations at the Time of Discharge

Type of surgery	No. of cases	RESULTS		
		Good	Fair	Poor
Skin flap	10	7	1	2
Muscle flap	3	-	2	1
Myocutaneous flap	9	8	1	-
Fascio-cutaneous flap	6	4	1	1
Filletted toe	1	1	-	-
Cross leg flap	2	-	1	1
Cross foot flap	2	1	1	-
TOTAL	33	21	7	5

Table-VI Duration of Hospital Stay

Day from operation	0-9	10-19	20-29	30-39	40-49
No. of ulcers	3	5	20	3	2
Percentage	9.1	15.1	60.6	9.1	6

Table-VII Complications

Nature of Complication	No. of cases	Percentage
Infection	15	45
Flap necrosis	6	18
Loss of skin graft	4	14

cases. It was managed by wound debridement and split skin grafting. Loss of skin graft was observed in 2 cases (Tab. 7).

The over all recurrence rate was 15% at 6 months follow-up.

Discussion

Plantar ulcers in Leprosy result from the breakdown of an attenuated foot under conditions of unprotected use.

Borderline cases were more commonly involved (93%) than lepromatous cases. Similar obser-

vations were made by Languillon (1964). This is due to early nerve involvement in non-lepromatous cases.

Of the 10 patients treated by local rotation skin flaps, 7 patients (70%) had good results. Similar results have been reported by Sommerlad (1978). These flaps are not suitable for bigger defects and the degree of rotation is limited. Function less toes can be used for filleting forefoot ulcers over metatarsal heads.

The heel ulcers treated by muscle flaps healed well but the forefoot ulcer treated similarly failed. This is because of lack of distally based vascular supply. Ger (1977) reported similar results and concluded that muscle flaps are suitable for heel ulcers only.

The flexor digitorum brevis myocutaneous flap used to treat plantar ulcers yielded excellent results. Similar results have been achieved by Shaw and Pandit (1988). The flap serves as a mechanical and vascular component. Even though one of our cases got infected it healed fairly well.

The fascio-cutaneous flap used to treat heel and forefoot ulcers healed well. Baker (1990) reported that the advantages of this flap are three fold. (1) The secondary defect is not devastating functionally (2) Muscle function is preserved (3) The flap directly gains attachment to deeper structures.

Cross-leg and Cross-foot flaps gave fair to poor results. These methods are time consuming involve prolonged immobilisation of the patient. (Morris, 1978).

Out of 33 feet operated, we had good results in 21 cases (63.7%), fair in 7 cases (21.2%) and poor in 5 cases (15.1%) at the time of discharge. The over all recurrence rate was 15% which is considerably low by any surgical method.

Conclusions

On the basis of results obtained it is concluded that flap surgery if done skillfully is durable. It reduces hospital stay and lowers the chances of recurrence.

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